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**The image of science in two daily Finnish  
newspapers.**

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**Abstract:**

The title of the study 'The image of science in two daily Finnish newspapers' has a twofold meaning. On the one hand, the science pages of two main newspapers in Finland, Helsingin Sanomat (HS) and Aamulehti were examined. Both newspapers have a special science page published either once a week (HS) or every other week (Aamulehti). The focus was on how photographs and graphics were used to capture the readers' interest.

On the other hand the social image of science, created in a public space in a daily newspaper, was examined. The hypothesis was that images used in newspapers create an image of science and scientific research. Either this building process in newspapers is conscious or unconscious. It affects readers' minds how they see science as an institution and as an activity. The paper also shows how powerful images can be and how little this power is recognized in society.

The images used were divided into three categories: photographs, collages and graphics. The use of different categories in both newspapers was very similar. In HS traditional photographs played the most important role, whereas in Aamulehti the biggest pictorial effort was put into collages (manipulated photographs with added graphics).

The final results of the research into the image of science in these newspapers could be summarised in these boxes:

Aamulehti:

Helsingin Sanomat

<ul style="list-style-type: none"><li>• An effort to bring science closer to everyday life.</li><li>• Scientific knowledge can be represented in an image</li><li>• A striving for a large readership (not only for those interested in science).</li><li>• Science is humorous.</li><li>• Images are clearly used to capture attention.</li><li>• Extensive popularization of topics.</li></ul>	<ul style="list-style-type: none"><li>• Science and research is a special type of work done in special places by special men/women. Scientific knowledge cannot be shown.</li><li>• Less effort put on popularizing science.</li><li>• Images are used to illustrate the article.</li><li>• Consciousness of a more professional readership.</li></ul>
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## **1. Introduction**

In the newspaper world, written text – an article – is more respected than images. Press photographs are not regarded as important as the written content of newspapers. This is a strong statement, but I hope to be able to provide some evidence for this argument later in this paper. Whether the minor respect of press photographs is due to the lack of knowledge about what they mean, or whether it is a professional attitude regarding writing being a more important skill than giving visual expressions, I would argue for both. The economic situation for most newspapers has also had an influence on the use of photographs. In 17 European countries, which took part in the survey funded by the EU in autumn 2009, professional press photographers have been used less by newspapers than before and photographers have been replaced by ordinary journalists without any special training in photography (Photojournalists. An endangered species in Europe?, p.4, [www.suomenlehtikuvaajat.fi/pdf/Photojournalists\\_ENG.pdf](http://www.suomenlehtikuvaajat.fi/pdf/Photojournalists_ENG.pdf)).

The essence of an image is more difficult and vaguer than that of a newspaper text. An article in a newspaper, written in a good journalistic manner, should not be vague at all, whereas a good photograph in a newspaper can raise questions and even confusion over the issue to which it is attached. The essence of a photograph as partly a real life document, partly a subjective work of art, can be strange in the media environment which flags up strongly impartiality and objective truth.

The typical idea of a journalist working for a newspaper is a person who is skilled at using words and telling true, reliable stories. Words create a linear and logical narration that glides in harmony with time. Then there are photographers, those quiet men/women who have a camera or several cameras hanging around their neck. When something has happened, they come from the rear end, take their photographs and then they disappear. They are also storytellers, but their stories have a different grammar. An article is a linear story in time but a photograph does not narrate in itself. The cultural philosopher, Susan Sontag, says in her book 'On photography' that a camera breaks linear time, making reality atomic, manageable and opaque. It is a view of the world which

denies continuity and interconnectedness. 'The world becomes a series of unrelated, free-standing particles: a set of anecdotes' (Sontag: *On Photography*, p. 23, Penguin Books 1979).

A photograph is reassuringly familiar, not least because it seems to reproduce that which we see or might see. In so far as visual representations contribute to constructing and reaffirming our identity, this familiarity and the apparent realism of the photographic image render it a particularly powerful discursive force (Liz Wells ed., *Photography, a Critical Introduction*, p.37, Routledge, London 2009).

In the field of media research, there is a whole range of content studies focusing on written texts or the language used by journalists. The interest in the study of journalism has been heavily governed by the common intellectual trend to focus on language and its uses. Press photographs are rarely taken into academic focus. There is some attention paid to famous photographers and their work but the study of photojournalism lacks the variety of analysis of press photographs that have been used in newspapers. One can easily find thick, expensive books of a large size, presenting the photographs of named press photographers but, very often these picture galleries lack completely any analysis of the images. Furthermore, this kind of interest in images is closer to art history than journalism, since the context, the newspaper, is put aside. In recently developed studies of visual culture, press photographs are taken into consideration with all of the other visual elements of our culture and society. That is progress, but what I would like to see is that the hard core of media studies could include the analytical study of press photographs as well.

Newspapers are a visual medium, although we seldom think of them as such. The fact is that readers do not get the content of the article unless they stop to read it. A good title is a way to capture the reader's attention but so are the photographs. As readers, we can skip over the article but the image hits us in the face, whether we want it or not. The censorship of strong images in our western culture (films, advertisements) is largely accepted, since the impact of images on sensitive people, especially young children, is known. However, the fundamental human right, the freedom of speech and freedom to publish, does not allow any kind of censorship in a free democratic society (excluding incitement to racism or other discrimination). This different

attitude towards the free availability of the written text or an image is a clear sign of our belief in their diverse impacts on the audience.

Very often people, at least in Finland, say that they are used to reading newspapers in the morning with their breakfast. However, most of them do not really have time to read the newspaper, and more or less browse the pages, stopping only when something interesting catches their eye. What is it that arrests us so that we stop and put our coffee back on the table? In a book entitled *Practices of Looking*, Marita Sturken and Lisa Cartwright use the term *interpellation* to explain what happens between a viewer and an image (Sturken, Cartwright, *Practices of Looking*, p.50, OUP 2009). The term itself comes from the philosopher Louis Althusser and, in this context, it is used to describe the moment when the image draws the viewer in as a spectator, impelling him/her, although he/she knows that the picture is not meant solely for him/her but to a larger group of audience. What is needed is that, as a viewer, he/she shares the codes and conventions through which the image becomes meaningful (Sturken & Cartwright, p.50, OUP 2009).

## **2. The aim of this study**

The core of this study is to take a closer look at two main Finnish newspapers and their science pages. The newspapers are Helsingin Sanomat and Aamulehti. The first is read mostly in southern Finland, but its circulation covers the whole country. Aamulehti is a leading newspaper in a region around Tampere, the second biggest town in Finland. Both newspapers are politically impartial. What makes these newspapers unique is that they both cover scientific issues once a week on a specific page. This page is normally a combination of one big image, sometimes a photo, sometimes graphics, and a written article or several shorter articles. I have chosen the science pages because science is not something that happens in a certain place at a certain time but it is more like a slow evolution of ideas. On the special science pages, the journalists have more time to develop the story than in the fast news room. Therefore, the choice of photographs and other images can also be made with consideration.

A typical science photograph in a newspaper is a microscopic view of something so small that the human eye cannot see it without help, like the spirals of DNA. In this kind of photograph, the idea is to show to the public what a scientist is probably able to see in his/her laboratory. A photo takes the viewer of the image to a laboratory, where the scientist steps aside for a moment, gives the reader a lens and says: Look, this is our reality. Seeing is believing, and a photograph which illustrates moments of scientific research can reveal to us the structures of reality that laymen could not otherwise see. In another example, a photograph on a science page can be used as an image of our future. This is something a photograph cannot do in a direct way, since a photograph can show only what already exists. This is a difference between a written language and the language of a photograph. Their relation to time is not equal, since a writer has no problem in telling us in what kind of world we shall live unless we make serious efforts to stop climate change. However, the photographer has to take another angle for his/her story because the future cannot be photographed.

Since press photographs are seldom discussed in studies of journalism, I will start with some questions about the essence of a photograph. The practice of photography has a Dr Jekyll and Mr Hyde nature: photographic art and documentary photography are sometimes united, sometimes



sharply separated. In photographs, reality can be created or documented – often both at the same time. Therefore, the definitions given in one context may not be useful at all in another.

Therefore, I agree with the main argument of Janne Seppänen and Liz Wells, who write that there is no such thing as a photograph in-itself but many different uses of photographs. In this paper, I use the word 'photograph' and 'image' and sometimes also 'picture' side by side, since every photograph is also an image and a picture, even though the latter concepts have a larger meaning as well.

In this paper, I will focus on press photographs, graphics and other ways of packing the journalistic message into a non-written form in two Finnish newspapers, published in 2008. Since the science page in Aamulehti comes out only every other week but Helsingin Sanomat has a science page every week, I have chosen the same number of science pages from Helsingin Sanomat as close to the date of Aamulehti's pages as possible. The number of science pages per newspaper in this study is 27, making a total of 54 pages. My main questions are: What do the science pages look like? What kinds of photographs are used to illustrate the articles? Are the photographs helping me to get the message? In this study, I will also take a closer look at how science is defined in these newspapers and how different disciplines are given space. However, I will not make a comparative study of the text and images but I will only focus on visual effects.

I will put myself into the position of an average viewer/reader and try to focus on how I receive the messages of the photographs. Therefore, my interpretations will be rather subjective, but as the professor of photojournalism, Janne Seppänen, from the University of Tampere, states in his book 'Valokuvaa ei ole' ('There is no photograph', own translation), it is important to focus on the receiving side of the press photographs and not just the process of taking pictures. My earlier studies include philosophy, art history and education, so I am unfamiliar with the specific language or images that natural sciences like physics, chemistry, biology or medicine operate within. As an educated newspaper consumer, however, I regard myself as a possible subject belonging to the target group of the science pages in these named newspapers.

As I said, my main focus will be on photographs and other images on the science pages and not on the written articles. Nor am I looking for 'bad science', although I am aware that there are

cases where a journalist has not understood what he/she has been reporting, and unfortunately that happens also in science news. According to my experience as a member of the board of the Finnish Science Journalists Association, the journalists are not the only ones to blame for 'bad science'. Of course, it is a journalist's challenge to report truthfully and to popularize natural sciences in such a way that both scientists and readers can be satisfied. To popularize science successfully requires trust between a journalist and a scientist. However, the trust must not exclude critical questions. I do not like the uncritical, admiring attitudes towards some hard core specialists in science that some journalists seem to have. This attitude is challenging to impartiality. A journalist should not have anyone or anything to admire when he/she is doing his/her work.

### **3. An image has power**

Since reading and writing have become general skills in most parts of the world, the role of images in communication has decreased. The word has beaten the image in terms of communication. This reflects our concept of man as a reason-based being, and of knowledge as accurate statements with a strict logical structure. Pictures as a means of knowledge are referred to when the Middle Ages are in question, when uneducated people stared at frightening paintings on church walls in candlelight. Growing up as a modern human being has meant proceeding from images to written text. In literature, all kinds of pictures belong to children's books; adult books are marked by a lack of images.

I would like to remind you that, before any kind of alphabetical system saw the light, human beings transmitted messages through pictures. Even today, there are cases when pictorial communication can be the best way to promote messages. A group of social workers rediscovered the power of images in developing countries when they started to use comics in the campaign for birth control and women's health. This was an easy way to get illiterate women to participate in the campaign. One of the advantages of narrative images is that issues which are rarely raised for discussion because of their intimate nature must not be said aloud. It is enough to show them.

Our tendency to divide the world into two categories is just what has happened also to our media world: There is a text and there is an image. It is not rare to hear claims that many television programmes, like 'talking heads' discussions, could easily be broadcast on radio without any remarkable loss. This opinion implies that only the auditive content is regarded as journalism and the picture on a television screen is something extra. I would like to interpret these arguments as an old-fashioned fear of images. The faces and bodies of the participants in a discussion could possibly draw the spectators' attention to irrelevant details about the cost of the 'true' message which should be protected and understood objectively without any personal data that might blur the pure spoken information.

In a more philosophical way, I would like to ask if we have a tendency to regard photographs as more irrational and unambiguous - like feelings and desires – whereas words and arguments are considered more rational and therefore fundamental to knowledge. A cliché which says that a photograph cannot be emptied by words is true because a photograph is open to several possible interpretations.

A photograph needs an interpretation. To develop an interpretation depends always on the viewer's cultural background. There is an old Swedish painting where a group of naked white children are washing and taking care of a little black boy. A present day spectator does not necessarily see anything suspicious in the painting. The tranquillity and harmony of the atmosphere are almost touchable and the children seem to be playing in peace. The racial meaning of the painting becomes clear when we see the original text attached to it: Useless work! (Fåfång möda, David Klöcker Ehrenstrand 1629-1698, Swedish National Museum) For the interpretation of an image, it is important to share the common cultural codes. If there are too many strange things in the picture, we cannot see anything and we completely lose the meaning. The Finnish press photographer, Martti Lintunen, has written that to understand what we see is a thing we grow up with. There is no such thing as a pure look (Martti Lintunen, Baabelin Kuvat, p.21, Like 2007). If I write 'a cat', it means a cat; no more, no less, but if I have a photo of a cat, far more questions and possible ways of interpretation come to my mind. Whose cat it is? Why was this picture taken? What is a cat referred to?

Let me put the difference between a word and an image into fashionable gender terms: in the dichotomy we have inherited from Aristotle, reason (ratio) used to be linked to the essence of a man. Therefore, a thought, signified by words, is a logical picture of facts. As Ludwig Wittgenstein writes at the beginning of his famous Tractatus, words could be attached to the male gender, whereas the female gender is less rational and more led by the emotions and so could be closer to an image. Perhaps this partly explains why the most common picture in the western world is probably a naked woman! The female body is suitable for an image since the focus in the woman has been on the body rather than on the ratio. But this is the case only if we take a split world and the different essences of the genders seriously. I do not, but this gives us perhaps one perspective for looking at the essence of photographs.

I love photographs and their ability to capture the moment, for an endless time. This is something unique. In reality, time passes by and we have no means to stop it, just to memorize it, but as we all know, memory is a weak tool for reproducing the past. Especially old photographs are stunning when we take a closer look. And I stress 'a closer look', because that is what a photograph allows us to do. I cannot say to a real, stranger, "Would you mind staying there for a moment? I would like to examine you". Photographs are very important for our memory as individuals but also as a nation or at the global level. They are the cornerstones of our collective memory (Wells, p.29, London 2009). Previous generations, damaged nature, buildings, cultures – as far as they have been photographed – can survive, if only in pictures. Old photographs can also teach us that the past is not far off somewhere in almost a fictional place. The past was here, in a world very much like ours, and the people living in it were like us.

Revolution needs images. Without the pictures of Che Guevara, which spread through the world, he would not have become the man he is. A revolution that does not understand the power of images will not hold the power for long. Remove the photos from the public sphere and the revolution is over. I remember when I was walking along Nevski Prospekt, the main road of St Petersburg in late winter 1989, something was missing. The walls that used to be covered by the faces of the Soviet leaders or army officers were gone. It did not take me long to notice that the revolution had come to an end. The removal of the faces from the walls was a signal to the people, even though the old regime was still in power.

Take for example scientific revolutions: The theory of evolution is a very visible theory. To illustrate the similarities between species is far more efficient than just describing them in writing. Pictures also make a complicated theory more comprehensible to the general public. Images allow their audience to discover the central idea themselves instead of telling the audience from on high how they should think. Once again, the strength of an image is in its interpretation. Interpretation is an active act instead of passive hearing or reading.

Compared to other images, photographs are iconic by nature; that means that they resemble the original object in a very strong sense (despite being flat), and therefore are more convincing than

other images. The iconic nature of a photograph makes it easy to believe in them, but it also prevents us from seeing the other layers of a photograph. The interpretation of a photograph stops too often at what is seen on the surface.

The debate that started five years ago about the caricatures of the Prophet Muhammad in a Danish newspaper is clear evidence of how much power an image, even a drawn one, can have. This case is a good example of what is regarded as the iconic essence of an image. An image as a sign is regarded as an icon of the object it represents. In semiotics, an 'icon' means that a picture has a kind of a mirror relationship to the original object. A picture looks like the original object it represents. Sometimes a picture is believed also to have some shared attributes with the original object besides the plain outlook, like the power to heal or to do evil.

The iconic has to be separated from the concept of an 'index', which means that the picture and the object of the representation are in a causal relationship with each other. That means that the real object is a reason for the image, like a footprint in pure snow. In the case of a drawing, that is not necessarily the case, since an artist can draw anything from pure imagination. On the contrary, a photograph has always an icon- and an index-like relation to its object - as far as we are dealing with 'real' photographs and not virtual realities.

The iconic nature of a photograph is very deep in us. It is common to see some advertisements on the streets that have been given an extra touch. A pen in a pocket seduces us to perform an intervention: moustaches, giant eyelashes or the signs of a battle in a cheek to a beautiful model selling us perfume. Deep down in such an intervention is a primitive belief that we are actually harming the real person. In certain cases, a photograph can also create a concept of a person; a portrait of an unborn child in sonograms shapes our perception of life before birth. A picture supports the view that a foetus is a person because it looks like a human being. Therefore, sonograms have been widely used in anti-abortion campaigns (Wells, p.194, London 2009).

Personally, I was very impressed by the scene in Thomas Mann's novel, *The Magic Mountain*, where the patients in the sanatorium for tuberculosis exchanged with each other the x-ray images taken of their lungs. That was the most important picture of their severe reality as well as an act

of affection. It was the lungs, not the face or body, that was crucial in the sanatorium. An x-ray image of lungs in a newspaper would not affect them similarly. A photograph needs a context, a situation and a function in order to be meaningful but, once these conditions are fulfilled, the image has a power that is difficult to beat.

Photographs have no morals; they support any ideology that they are given. A photograph is like money: it goes with anything: pornography, the police, as well as the archives of mental hospitals use photographs to govern us (Seppänen, p.130, Helsinki 2001). Actually, there is no such object as a photograph, unless we think that a flat, white piece of photography paper or a blank computer screen are pure photographs. A photograph is obviously not that. It is the combination of content, context and the planned function in a given historical situation that makes the photograph (Seppänen, p.42, Helsinki 2001). The virtual world has made it possible for anybody to reuse any image and create new meanings with it. Political slogans can be attached to suitable commercial images and can find virtually countless new viewers on the web. Once a picture is launched, it is open to wild reuse and it can give birth to wild combinations. That happened when a photograph of Abu Ghraib was mixed with an advertisement for the iPod by the artist Copper Greene. He created new meanings to the image of a man standing hooded on a box with electrical wires attached to his hand. The man had been told that he would receive an electric shock if he moved. The slogan "iPod: 10 000 songs in your pocket" was replaced by the slogan "iRaq: 10,000 volts in your pocket, guilty or innocent" (Sturken & Cartwright, p.85, OUP 2009). Images are both representations and the producers of the ideologies of their time (Sturken & Cartwright, p.93, OUP 2009). They are not innocent mediators of ideologies but they also produce them actively.

Take for example the consciousness of environmental problems or a quite recent awakening to the conservation of nature from the beginning of the 1970s. The photographs of dying animals, destroyed forests or overcrowded cities in newspapers touched us. Step by step, the recycling of these images gave birth to an awareness that nature was suffering because of man, even though our own backyard would have been in proper order (Seppänen, p.138, Helsinki 2001). The repetition of an image is powerful, since a reader of a newspaper can easily ignore the text but a photograph forces us to look at it (Seppänen, p.162, Helsinki 2001).

The power of photographs is often emotional in nature, but it needs someone to look at the picture. The human look, human gaze, brings forth the power of an image, so the power is a relationship between the one who looks and the image as an object. What sort of interpretation emerges from this look depends on the looking subject's culture, personal history, gender and social status.

A photograph needs a context in order to be understood. A newspaper article offers a natural context to a photograph since, unlike memory, photographs do not in themselves preserve meaning, but the meaning is a result of an understanding function (Wells, p.55, London 2009). The 'plain' photographs – photographs without context – offer appearances, but the photographs themselves do not narrate anything. Therefore, we could say that most photographs are the 'memories of a total stranger' which lend themselves to any use (Wells, p.57, London 2009).

It is accepted that an advertisement affects us; they want to sell us things and trends. When a photograph is in the category of an advertisement, we are aware of this. But what about press photographs? Are they impartial; can they be completely impartial? Personally, I have never met the current president of Finland. The image I have of her depends on press photographs and the TV news, but are the photographs of President Tarja Halonen in the newspapers objective? Can a photograph be impartial and, if so, what does it mean? A tiny black and white passport photo is trying to give an objective image of ourselves to the custom officials. (Perhaps this explains why we so often think that our passport photos are terrible.) I assume that objectivity is not what a press photographer is primarily seeking.



#### **4. How it all started: the camera as a scientific tool.**

A camera has traditionally been understood as a lengthening of the human eye. To see something in a photograph has meant almost the same as to see it with your own eyes, just using the eye of the camera. This ability of photographic technology to expand the capabilities of the eye was noted in the early part of the 20th century (Wells, p.192, London 2009). Before cameras, observing was regarded as an art, reserved only to limited, gifted persons like Linneus, the Swedish plant scientist, or Michelangelo, who was deeply interested in the human body (Kelley Wilder, *Photography and Science*, p.18, Reaction Books, London 2009). In this chapter, I want to show how the use of cameras and photographs has played a central role in scientific research since the beginning of the history of photography. Photography emerged along with the discourse on science, medicine, the media and other institutions of everyday life that made visual reproducibility one of the imperatives of modernity (Sturken & Cartwright, p.185, OUP 2009). Through photographs, scientists could get new sorts of evidence and a wider acceptance and respect for their work among the general public. There are various dates for the event when photography was introduced to a large public, but in her book, *Photography and Science*, Kelley Wilder ended with the year 1839 (Wilder, p.7, London 2009).

Before the development of cameras and photographic methods, to show the findings of reality to an audience or fellow scientists demanded special drawing skills and years of learning (Wilder, p.18, London 2009). Every scientist and every expedition had their own men to make drawings, unless the scientist was good enough himself. It was important to be able to show people back home what they had seen in foreign places. When cameras were invented, they were immediately adopted for use in science and by scientists. From the beginning, photographs were seen as a scientific eye, derived directly from the metaphor of the camera-as-eye analogy (Wilder, p.11, London 2009).

What could be more convincing than having visual access to the sources of scientific knowledge? A camera made observing possible to anybody who had sufficient tools and the knowledge to use

it. Needless to say, the time was ripe for the large use of visual evidence, since the empirical method was regarded as the best one for scientific experiments. However, the days of positivism were still ahead. Liz Wells states that the positivism of the early 20th century was influenced by the use of photography and that it was centrally implicated within empirical research as a recording tool (Wells, p.25, London 2009), so the use of cameras in scientific research was not just a case of new technology but was also seen as a way to strengthen the new waves of methodology.

The advantages of cameras and photographs were considered to be several. First of all, a camera was mechanical and thus indefatigable. Because it was mechanical, it was supposed to be objective and thus reliable (Wilder, p.18, London 2009). Photography was invented through scientific research and therefore was suited to the hands of scientists, who very soon realised the advantages of cameras compared to human drawings which took much more time and were dependent on subjective skills. In the beginning, cameras were regarded purely as a mechanical device and it took a while before the concept of subjective choice or artistic values were used in the evaluation of photographs. The first cameras were not easy to use and a lot of equipment had to be carried with them. Despite the complexity of their use, or because of it, the image – a photograph – that the camera was able to produce, the ‘true image of reality’, was revolutionary. It opened up new ways of seeing the world. For example, by using several cameras, it is possible to see what happens at high speed. Was the galloping horse completely in the air for a moment or not? The problem was that relatively few people really understood the mechanism of cameras and what was going on in the photographic emulsion. The lack of knowledge raised some questions about the reliability of photographs when a camera was used to make the invisible visible (Wilder, p.52, London 2009). Even today, we speak of taking photos instead of making photos, because the process of the final production – the photograph – is not easy to understand. It seems that they have come out of traces from the scene itself rather than as carefully fabricated cultural objects (Wells, p.106-7, London 2009).

What was the camera able to do in scientific terms? Very soon it was able to make the invisible visible. Take for example x-rays and their use in medicine. Secondly, a camera was able to focus on details. It could enlarge small details (microscopic photos) or reduce big entities into a sheet

size photograph (stars in the sky) (Wilder, p.43, London 2009). Through the history of modern natural sciences, the aim has been to unveil nature from mysticism and obscurity, to map the reality from the surface to the ultimate bottom and to show the results in public. Why this was important is best explained by the slogan of Francis Bacon: 'knowledge in power'. For that mission, a camera was a central device. Today, we want to see, for example, what viruses look like. Although as a layman we cannot understand the mechanism between a seen virus and a severe disease, the face of the enemy – a virus – helps us in a battle: we are fighting against a *real* thing. One could assume that there were more discussion about the role of photographs in scientific journalism after the digital revolution and the spread of tools for digital manipulation, but there is none (Wilder, p.15, London 2009).

In earlier times, scientific tools, like historical maps of the known world or the celestial universe, were decorated very aesthetically. Aesthetics was part of science. The old equipment was of the highest quality handicraft and owned by the nobility and rich (Oxford Science Museum). One could claim that the value of empirical evidence excluded aesthetics from science, but not for long. The abstract nature of photographic observation in science, as in physics and chemistry, developed very closely to abstract photography or painting and that uniformity has been recognized both in science and the arts. Kelley Wilder gives examples of aesthetically great science photographs which were used consciously on the front pages of science journals like *Physics* (Wilder, p.54, London 2009). Although science photographs were scientific evidence, somehow they seemed to follow the aesthetic trends of their time. Science photographs are not outside the concept of aesthetics or the visual culture of the époque, just as any image is not.

We do not speak of cameras as a mechanical eye any more. Still, at a very human level, we tend to think that photographs are an objective, open window onto the real world and, yet, paradoxically we know that it is just a picture printed on a piece of paper that has undergone several subjective selections. Important is not always what the photograph shows but what it does not show, what is hidden from our sight. Take for example all the tourist guides with fantastic photographs of our holiday destination. There are no crowded streets, no rubbish, no dogs, no beggars and no salespeople; almost no people at all, except for a lonely fisherman in his boat. When we read the guide books, we are not surprised by the beauty of the places, because these

are the kind of photographs we want to see in tourist guides. Still, I argue, we know that this is not the reality. When we arrive at our holiday resort, time after time, we are surprised: it does not look at all the same as it did in the photographs, but the majority of our disappointment is a disappointment in ourselves. We recognise the self-deception we are guilty of, once again.

## 5. The truth of a photograph

The overused slogan – ‘seeing is believing’ – is a stupid one, because, if that were the case, then we should believe that the Loch Ness monster is real and that there has been several invasions of unidentified flying objects to planet earth because there are several photographs that claim to have recorded the visit. The opposite also applies: if something cannot be photographed, it does not mean that the object does not necessarily exist. In this chapter, I try to outline the basic guidelines behind the theories of a photograph in relation to truth and reality.

Another slogan – ‘photographs do not lie but liars can take photographs’ – has actually never been true, since photographs can and do lie. It would be far too easy to point out that, since digital manipulation came into use, we can no longer believe in photographs. A much more interesting issue than the question of manipulation is our natural trust in visual evidence. Realism has been considered the natural essence of a photograph since the beginning of the camera era and, according to that, we call a painting style which tries to imitate nature in every detail photorealism – implying that a photograph brings about realism. However, Seppänen asks if photographic reality is more like an ideological construction which is produced from the different uses of photographs (Seppänen, p.25, Helsinki 2001). Empirical evidence as a mark of truth is what we have learnt to believe in since modern times, and therefore we can argue that a photograph is an example *par excellence* of what we call a correspondence theory of truth: a photographic image corresponds to what has happened at a certain time and in a certain space, but we can do that only if we can add an interpretation to the photograph, if it is not a ‘stranger’s memory’ to us.

We use photographs as signs of truth, but this does not mean that the pictures in themselves convey true statements. As I pointed out earlier, every photograph needs an interpretation, a narrative context, which allows us to make truth claims. The number of possible interpretations is, of course, large. A photograph is not a thought that can be read in just one way. Another fact is that every single photograph is a result of the creative effort of a photographer (Seppänen, p.166, Helsinki 2001). Also in documentary photographs, it is quite normal that the photographer

arranges situations, choosing a suitable angle and lighting. As a result, the truth of a photograph is the combination of two sides: first, what the photographer wants to show us and, second, what kind of meaning and interpretation the viewers give to it.

Liz Wells writes that the notions of a photograph as an empirical proof, as a witness offering a descriptive testimony, rests upon the view of reality as external to the human individual and so is objectively appraisable (Wells, p.27, London 2009). Since the early period of modernity, we have come a long way towards what could be the phenomenological position of a subject-object relation. Is it thus relevant any longer to make a sharp distinction between the passive object-like reality outside ourselves and the subject as an opposite, active agent facing the reality and making sound observations about the nature of reality? The interaction of several active subjects and the fusion of the interpretative elements are more likely to produce the final narration of any given photograph. In photojournalism, the expectation that a photograph will represent an event realistically and accurately is still strong (Wells, p.36, London 2009). However, the press photographs follow the same pattern of meaning-giving and interpretation as all other photographs.

Since the quality of the photograph is no longer a problem, the moment of 'truth' has become the competitive element in photojournalism, as if we would compete in truthfulness by narrowing the time of the real-time event and the published photography. Is an image which has fresher blood than another more true? If the bodies on the battlefield are still warm and the exhaustion of battle is still to be seen on the faces of the dead soldiers, does this give the photographs a more 24h reality-show aspect? Personally, I do not mind this kind of truthfulness, since it turns wars and catastrophes into spectacles, giving the readers of the newspaper a safe place from which to watch the war and express their sympathy. Liz Wells writes about the hungry for spectacles and how these images will draw attention in the news and encourage sales above those of rival newspapers (Wells, p.210, London 2009). In the past, the hunger for spectacles included a real risk when the so called war-tourists were concretely shipped to near the battlefields where they could experience the war at a risk of being injured themselves. This was the case for example in the western Baltic sea during the Crimean war, which has been the first photographed war ever.

When Seppänen says that "A real reporter experiences personally what he captures to the film: Laugh, tears, joy, sorrow, tragedy and comedy. Only through subjectively experienced objective facts the work of a photojournalist can become a witness of its own time" (Seppänen, p.65, Helsinki 2001), he is not demanding that the press photographer should go to the front line to be able to capture the fear of death in the war. The experience is more a professional attitude than a demand to go into the midst of the events. To be conscious about what is happening and to be honest in reporting are more important than activism in participating. A Finnish photographer, Martti Lintunen, writes in book that, as a photographer, you have to be personally involved in what you are doing. What 'personally' means could be interpreted as taking a position in a situation and avoiding looking at the world as an outsider. This personal involvement has to do with the impossibility of maintaining absolute impartiality in photography. Seppänen offers more arguments on behalf of this writing that the demand for subjectivity is the biggest guarantee and the biggest thread to photographic truth (Seppänen, p.65, Helsinki 2001).

The essence of photography is full of paradoxes: one of them, related to the question of truth, is that photographs are at the same time the uttermost selective medium and completely without selectivity (Seppänen, p.60, Helsinki 2001). A photographer can decide freely what, when and from what angle he shoots, but then, after making the choice, everything that is in front of the camera will be included in the photograph. The mystery of photography has not disappeared from people's minds. During the summers of 1985-86, I worked in a laboratory where the films of ordinary people were developed. Sometimes, we received letters in which people expressed their wishes, like if we could change Grandma's shoes in her birthday photograph because in the photograph she is wearing working boots.

The fundamental question of the truth of a photograph is important in the newspaper context. Roland Barthes closes the discussion by saying that the truth of a photograph is a myth in two ways: truth is always a construction of culture, it is never pure and without context, and, secondly, a photograph cannot tell the truth because it has been digitally modified (Sturken & Cartwright, p.18, OUP, 2009). In practice, every photograph is constantly challenging us to believe in it. This is because the physical presence of the world is the origin of the source of the

image and an image stands as an index of the physical presence. It is this indexical status of a photo which relates it to debates about reality and truth (Wells, p.37, London 2009).

Liz Wells believes that the old assertion based on the authenticity of press photographs – I was there, I saw – no longer holds true, but is replaced by a new implicit claim to respect the suffering of others by producing more structured and complex works that function as objects of critical compensation. This moves the photographer out of the world of the media with its insatiable demand for immediate images into the work of art (Wells, p.91, London). Well's claim, or hope, can be seen as a preferable direction, but it would place a demand on the photographs used by newspapers. They need to be professional photojournalists to be able to use the image in a complex, metaphorical or symbolic way.



## **6. Science in Finnish newspapers**

Science is regarded as an important topic in Finnish newspapers. A good indication of that is the number of members belonging to the Finnish Science Journalists Association (FSJA), which is the biggest in the world. The latest figure was approaching 900 members. There are several explanations for that: FSJA accepts as its members scientists who frequently publish popular articles in their research field. Other important members are the communication personnel from universities or research centres. This co-operation by one single association is important for creating trust among journalists and researchers. The link between a scientist and a journalist is wisely fostered. The departments of communication play an important role, since university press releases are published by them. Thus, the whole chain is together making it possible to undertake good science journalism.

The general concept of science, including the natural sciences and excluding the humanities, is not in use by the Finnish Science Journalists Association. On the contrary, science is an umbrella concept, covering all academic studies from theology to economics and from history to medicine. I believe that this combination is the best possible way to create discussion and to give space for the plurality of voices. Also, a field like philosophy is strong, offered first to the journalist members of the association and secondly to newspaper readers as a means of argumentation. This combination of disciplines brings the notion of science close to what is regarded as a continental concept in contrast to the Anglo-Saxon definition of science as empirical science. Since the notion of science is not limited only to natural sciences, there is a great variety of opinions to be heard inside the FSJA as well as no monopoly of thoughts to promote. One could claim that this variety of disciplines together is also in accordance with the large community of academic research and its principles. A good indicator of that is the number of professors who are members of the FSJA from all fields of study.

Is this plurality of voices reflected also in Finnish newspapers? The answer could be yes – and no. In the newspapers I have chosen as examples for this study, science, particularly the science

pages, follows the Anglo-Saxon way of defining science as natural science. Among the 27 examples from Aamulehti and 27 examples from Helsingin Sanomat (HS), the majority of topics relate to the natural sciences (46 out of 54). There were exceptions, like, for example, archaeology, history and linguistics with an entry on the science pages. What was surprising was that medicine was mostly reported on the other pages of the newspaper except for neurology, that seemed to inspire a great interest among science journalists in these newspapers. The topics that were exceptions, being non-empirical science, were however chosen as 'near' the methods of empirical science. This means that it was possible to give the readers figures and years in the form of empirical data. One example of such a topic was the 'iceman' Ötzi, a human being who died 5,000 years ago (Aamulehti, 19.11.2008).

Science news in Aamulehti (fortnightly) has one special page that takes almost always the same form: the head topic, a short article on the lower part of the page, a column and a question of the week. Helsingin Sanomat is much bigger in terms of both circulation and size, and the weekly science pages cover two or occasionally two and a half pages. From HS, I chose to read the first page because it resembles most of the science pages of Aamulehti. The second science page in HS often includes several book reviews. In both newspapers, I took a closer look at only the head science topic which was very clear to understand.

Even though I have called the articles on the science pages 'news', they are not news in a strict sense, since the section is published just once or twice a week, making it impossible to follow the rhythm of news. The articles are rather feature-like popularizations of scientific research or of the results of research. When scientists report a real breakthrough or other important findings, they are first considered as news and reported briefly in other sections of the newspaper. Important doctoral theses are also regarded as news, and are normally reported on the pages about domestic issues. The topics chosen for the science pages have often a larger meaning for society or for our general knowledge. Examples could be: 'Cloned meat: is it safe to eat?' (Aamulehti 30.7.2008), 'You consume 4,700 litres of water every day' (Aamulehti 30.1.2008), 'Genetics attack national diseases' (HS 30.12.2008) or 'Climate change hits coral' (HS 26.2.2008).

Among the different disciplines, biology and environmental sciences were the most common, with 19 topics. Technology got 9 head articles, medicine, including neurology and genetics, came third with 8 topics and space research got 6 head topics. These main disciplines covered 42 out of the 54 head topics. All of the other disciplines had only one or two head topics, with the exception of futurology, which had three. There was no remarkable variation in the subjects among the two newspapers, the figures being almost the same. Biology and environmental studies governed the HS science page, having 17 articles compared to the 9 in Aamulehti. In the latter, there was a greater variation in disciplines; 8 different disciplines had the head topic once or twice compared to 5 in HS.

Even though there was no big difference in the disciplines mentioned, the approach or the tone of the pages was rather different. The titles of the articles in Aamulehti had a lot of humour and the language was almost poetical, based, for example, on the lyrics of Finnish pop songs. Most titles were smart and they often used previously established phrases. The journalist covering the story about iceman Ötzi found a funny association with the caption: 'Sorry Kimi, the real iceman is Ötzi' (the Finnish formula one driver, Kimi Räikkönen, is known as the 'iceman'). If the caption is too poetic, the subtext will offer keys to the article. In general, the idea seems to be to make the science page inviting to everybody, avoiding scientific concepts or academic language. These pages are not meant for experts but for ordinary readers. The target group is supposed to know something about the popular culture from the 70's and the decades after that; otherwise, the jokes in the titles are not clear to the readers. The layout of the science page in Aamulehti has a rather harmonious look; in most cases, the page is divided into clear sections, with one bigger image. The variation in the layout is small.

Helsingin Sanomat uses the science page in a more open way. The page does not have a regular form and the articles vary in length. The titles are often smart but they do not include as much humour as the titles of Aamulehti. A typical tone of a title is 'Brains are emotional organs'. There is a slight tenderness in the caption compared to the scientific phrase, but the overall image is more serious than in Aamulehti. Another example is 'The city is a hard home for birds'. The article relates how well many bird species have adapted to life in the city, but there are also more humorous examples: 'The fate of tuna fish: Sushi'. Also, these science pages are targeted at

ordinary readers, but more often the reader should have a basic knowledge of the subject in order to be able to read the article to the end. There are no popular culture references in the titles and science is represented as a more serious business than in Aamulehti. The front page of the science section of HS is targeted at most readers, and the back is more for science enthusiasts. It is obvious that the second page is supposed to be 'slow food' journalism. Book reviews and short articles can be read while the reader is working on the '10 questions', with chess or with bridge – exercises placed on the same page. Since HS is the biggest newspaper in Finland, it cannot take too great risks with serious matters. The image of the articles tries to create confidence in science as valuable work. Aamulehti plays more with the idea of 'wacky professors' inventing strange things, but this does not mean that the articles in Aamulehti will be careless. I would rather say that they are popularized further than in HS, but not at the cost of the content. The articles in Aamulehti are not tabloid-style journalism, even though they might want to attract more average readers than the science pages of HS.

It was surprising that there were three topics in HS directly related to the city of Helsinki. One of them was about the natural pond near the city centre and the ecosystem of the pond area. Another example is a brain cancer treatment at the local hospital. There were no topics in Aamulehti that could be related to the surrounding area of Tampere. However, Aamulehti is more locally read than HS, which more or less covers the whole country. Another surprising thing was that topics related to water were very popular. There were 11 topics covering water archaeology, coral, fish, lakes and water energy, 8 of them in HS. It is difficult to say whether this is a coincidence or whether it is due to our national image as a land of a thousand lakes. Also, the location of Helsinki on the shore of the Baltic Sea makes water a crucial element for city life. There did not seem to be any kind of relationship to local issues in Aamulehti. The articles were more at a general level and the sources were often from international science summits, as the journalist reported in the column. The deal seemed to be that, of the two frequent writers, another was covering international issues (Vesa Vanhalakka) while the other (Mika Remes) was covering more domestic topics. Vanhalakka is a permanent journalist in Aamulehti, Remes, working freelance.

In the next chapter, I will look at the visual image of the science pages. I close this chapter with the numbers of different kinds of images used with the head science topic in both newspapers.

The central image in Aamulehti:

- a photograph 11
- a collage 13
- a graphic 3

The central image in HS:

- a photograph 12
- a collage 11
- a graphic 4

A photograph means just one or two main photographic images with subtext but without any graphics. A collage means a combination of a photograph or several photographs with graphics or statistics. A graphic means a collage without any photographs. In the next chapter, I will examine these image groups in more detail.

## **7. The ways of using images on science pages.**

Despite the lack of academic research, an image is still a central factor for science news. In most cases, both in Aamulehti and in Helsingin Sanomat, the space occupied by images on the science page was larger than or at least as big as the space given to the text. This is a remarkable fact, since readers see the image first and there is a strong bond arising from the image, inspiring their further interest in the text. According to Janne Seppänen, the relationship between a press photograph and a text can be divided into four categories: 1. A photograph makes a complex scientific problem more concrete. 2. A photograph builds social relationships between the actors. 3. A photograph offers a possibility to stress the issue affectively. 4. A photograph creates news-like journalistic reality (Seppänen, p.162, Helsinki 2001).

The first category is clear and widely used in science pages. For example, most of the graphics go towards that. They are used to make the scientific content of the article more concrete, sometimes succeeding, sometimes not. When they do not succeed, they fall to the level of a schoolbook, being too educative and accurate, including too much unnecessary information. The second category is important when there are people in the photographs. How are they presented? Do they inspire trust or mistrust in them? Take for example a photograph about a doctor beside some new cancer treatment apparatus. What kind of an image is he transferring to the readers? There was a photograph of that kind among my material and, in that particular case, the effect was very reassuring: the doctor in the photograph was looking directly at the camera, as if looking at a particular viewer. There was a sort of promise in the picture: Trust me, I can handle this. The third category is widely used in newspapers but more difficult to adapt for science journalism. First, what kinds of effects are wanted and, secondly, is it according to the nature of science to be persuasive? However, I would put all the images, including humour (and there were many!), into this category because they do have an emotional effect on the reader. The fourth and last category is suitable for most photographs without any added graphics. The meaning of the photograph – which has been used to create a news-like journalistic reality – is often to show some action to make the topic actively present in one particular time and space. This is how I understand the ‘news-like reality’: Something is happening right now (even though it is not, possibly). Instead of

passively standing or sitting in non-recognizable surroundings, people are photographed in their work. There are several examples like this in my material.

These categories are important for understanding the meaning of a press photograph. It is not just a question of decoration; the photographs direct our attention, and they give us a subconscious mood in which to receive the article. When we talk about reading a pictorial newspaper article, it would be more exact to use the verb 'experiencing' rather than 'reading', says Seppänen (Seppänen, p.163, Helsinki 2001). However, reading is what most people think we are doing with newspapers. To experience an article sounds more fitting to propaganda. My question is, since photographs cannot be read but experienced, can they be impartial in the same way as an article tries to be? I do not think that they can, since an interpretation followed by an experience has a strong subjective tone depending on the viewer's personality, education, age, social status, culture, etc. The general notion is that the function of a press photograph is subordinate to the text, in order to confirm the sense of the news as an objective and transparent presentation and to support the chosen angle of the article (Seppänen, p.104, Helsinki 2001). In the light of what was said earlier, this is not the case. An image plays a much greater role regarding the content of the news and how it is interpreted by the readers.

The concept of our ability to 'read the pictures' is widespread, as if images could be 'read' like text. An image is not, however, like text: the language it uses is different from written language and the grammar is not equal to it either. It would be more correct to ask if a single photograph is narrative and in what way? It is clear that most photographs include in themselves several points of note. A single photograph is not like the opening line of a novel. It is impossible to neglect some words in a sentence without disturbance being caused to the whole content but it is completely possible to ignore the relevant points of a photograph if you are unfamiliar with the context. Instead of a complete story, the narrative content of a single photograph can be seen as a hypothesis that raises a question: What happened before the photograph was taken and what happened next? (Seppänen, p. 102, Helsinki 2001) The photograph cannot tell or represent to us anything about the past or the moment after the shot. It does not have any grammatical tense but it is always tied up with the present moment. Nor does it have grammatical persons. The narrative

subject is one and the same, without any variation, if there is a narrative subject at all (Seppänen, p. 99, Helsinki 2001).

Semiotics offers some useful concepts through which to discuss photographs. So far, I have mentioned the iconic and the indexical nature of photographs but another important notion is the metaphorical. As Seppänen writes, many successful photographs are metaphorical by nature (Seppänen, p.96, Helsinki 2001). 'Metaphorical' means a transition from one level to another. It is difficult to give an example of a metaphorical use of a photograph, since there are no rules for that. A successful metaphorical image must create new meanings; otherwise, it will become a symbol. There are cases in my material which I would call metaphorical: in Aamulehti (31.12.2008), the headline of the science page was 'A big explosion 2, the fuse is burning already'. It is difficult to translate the title accurately, since in Finnish the last part of it refers to a popular song from the musical 'Hair'. The manipulated image on the page is simple: there is a globe which looks like a bomb, and the burning fuse conveys thoughts of Christmas decorations, balls hanging on a Christmas tree. (The Christmas trees were still up in Finnish homes when the article was published.) I would regard this as a metaphorical image: at Christmas time, the time of the globe is (probably) running out. The article was about the mythology about the end of the world plus the recent scientific knowledge about this issue. It is not easy to create metaphorical photographs since a photograph is not as flexible as written language. An image has an indexical and iconic nature which attaches it to nature in a realistic manner and this is something that a plain photograph cannot escape. In written language, a metaphorical double meaning is easier to create, since most words are pure agreements.

A metaphorical meaning is different from a symbolic meaning, which is simply that an object in the picture stands as a symbol to another object/idea which is not directly present in the picture, like a snake is a symbol of evil, betrayal, or sexuality. The metaphorical use of a photograph is more complex. It requires the more sensitive use of signs, and a professional knowledge of visual culture. A metaphor is also more open to interpretation than a symbol. According to Seppänen, metaphors are practical in popularizing science and scientific thoughts. With a well-known expression, it is possible to illustrate complex processes and scientific theories (Seppänen, p.140, Helsinki 2001).



The fourth semiotic notion – proposed by Roland Barthes – that I find important is the metonymic nature of an image. This means that it is possible to use a single image to represent a larger totality. A single photograph of a disaster caused by an earthquake is meant to represent the whole event. A single animal, a fish, represents all of the fish in the sea. This is the way to use a photograph of a single animal, plant or human being to represent the species as a whole. These examples often have a black background to make a single unit appear more objectively representative. When a newspaper is buying photographs from big news agencies or uses stock photographs, they usually have the metonymic use of an image in mind: to find one good representative image to illustrate a happening.

Now, I will go back to my material. What kinds of photographs were used on the science pages in Aamulehti? The number of plain photographs was 11. They were:

- 2 photographs taken from a laboratory
- 4 photographs taken by means of scientific devices, impossible to see with the naked eye
- 4 ordinary photographs taken in various situations
- 1 photograph of the Beatles

The photographs are simple and easy to view. In some cases, a photograph works as a stop sign: a monkey in a box is moving an artificial hand (13.8.2008). Even though the picture is not of a very high quality – it looks a bit blurred – an animal in a box is an unusual and also an unpleasant sight. This photograph raises both curiosity and emotions. I wonder if the photo editor had thought of any negative references that this photograph might inspire: animal testing is largely criticized by the public. In another photograph, a female scientist is working in a laboratory (10.9.2008), with a bright face, big eyes and an arresting gaze. One of the rules for good press photographs is to have a clear shaped person with active eyes in a picture (Downman: A Guide to layout, design and publication, p. 88, OUP 2008) 3. A black and white photograph of the Beatles (8.10.2008) is not a common image on a science page. However surprising it may be, the chosen image tells us about the original research, where Beatles music was used in neurological research. Focusing on popular culture will surely attract more readers to peruse this article.

The category of 'ordinary photographs' is about images which are directly linked to the title and do not contain in themselves anything surprising. These photographs do not add anything new to the headline: a cow in a modern cowshed (7.5.2008), lightening in the sky (2.7.2008), swimming salmons (16.7.2008) and an old computer (21.5.2008). Half of these photographs have been taken by the journalist, while the other half come from the image bank. These photographs are relatively ordinary, unaccompanied by any special information or statement. However, after carefully examining these photographs, the reader (myself) might get an idea about why they were chosen rather than others: an intelligent cow (the headline) is walking towards a revolving door (difficult even for some human beings!), a retro computer with retro colours, and a beautiful, almost magical violet night sky with lightning. Only the pair of salmon do not give me any extra clue: the headline speaks about diseases among salmon but, looking at the photograph, I cannot find any key to it. There is just a shoal of salmon.

Only four photographs were taken using special scientific cameras and they show something that the human eye cannot see: a mosquito on a black background (16.1.2008) and blue balls floating among nude spirals (26.3.2008), a very artistic view about something which is not easy to localise on anything. It says above the image that it comes from the Science Photo Library, but the lay viewer's eye has no evidence about the truth or reality of the given photograph. It lacks the truth value because I, as a viewer, have no keys to the proper interpretation. When I try to interpret it, I can use only the discourse I know and that which is nearest to the image in my experience: from my point of view, this photograph could also be modern art since, in my trial interpretation, I use the discourse of aesthetics and more precisely of abstract art. These two examples (a mosquito and blue floating balls) have been taken by a microscopic camera. The mosquito photograph is a very typical science photograph with the idea of objectification: the insect on a black background is shown outside time and space. It is no longer a single mosquito but it represents the whole species.

The reverse way of using photographs, to show something from a great distance, does not seem to work properly. When the subject diminishes, the interest diminishes as well. In my mind, this kind of photograph has lost the effect of reality – they often look like animations – even though the value of its content is most certainly based on visual evidence. In both of the photographs in this category

of Aamulehti, the earth is seen from space. The first gives evidence about disappearing glaciers at the North Pole (18.6.2008) and the other one shows a spacecraft going around the globe (22.10.2008). The viewer needs to be interested in the subject in order to take a closer look at it, since all photographs of this style, at first glance, seem to repeat the same content. The repetition empties out the message from the photograph and so they do not capture the readers' attention or succeed in raising any sudden interest.

Regarding collage, it is more difficult to create any further inner categories, but there are three interesting cases where the photo editor and the graphic designer have really been thinking about the article. In the first example (30.7), the title says: 'Can I have 600g of minced, cloned cattle meat, thank you!' The picture is full of humour: there is a cow walking towards a mincer. At the other end of the mincer, there is an equal number of tiny black and white cows coming out. The handle of the mincer is wrapped in the American flag. This picture contains a statement and it is funny; it is not educational nor does it provide any further information to the reader. The other example (24.9.2008) is very witty. The title says: 'The secret of a text message murderer'. This sounds like the title of a crime novel and the whole article has been written on the opening page of a book. The graphics under the aperture of the 'book' show how using linguistics can be useful in crime investigations. The graphics look like notepads hanging on the walls of a police station in a TV series. The third example of extraordinary collage is really a work of art. The title says: '100 years old but the speed is accelerating' (2.1.2008). The article is about the future of Finland according to the Research Institute for the Future. The image is based on an old 3-part window that is typical of old Finnish houses. What you can see from the window is an old woman's bicycle, a sushi plate and a nuclear power station. The window frame is surrounded by old fashioned pink wallpaper. The image has no subtext, no statistics, just a view: Three different Finlands together. Nothing more is needed; the message is left to the viewer to interpret. The collage does not need any additional text since all parts of it show very familiar things to every Finnish newspaper reader. These three examples of collages published in Aamulehti need time to prepare. On a science page that is published weekly, it is possible to use the picture in as inventive way as this. There also seems to be good general planning of the whole page, since the small photograph at the bottom of the page is often in line with the main photograph at the top of the page. The common feature between them can be colour, an issue or even the form of the visual content of the photograph.

Now, I will move on to the photographs on the science page in Helsingin Sanomat, and discuss the graphics of both newspapers together later. Compared to Aamulehti, photographs are paid more attention in HS, although they are used in more traditional way. Clearly, the photographs are regarded as the main visual media in HS, whereas collages are the most elaborate images in Aamulehti. Compared to Aamulehti, the science pages in HS look more like average news pages. The visual field in HS's science page is usually very big and the photographs (no graphics included) can easily be divided into three categories:

1. Photographs of scientists at work (7 )
2. Nature photographs (3)
3. A scientific tool: a particle accelerator (1)

All of photographs in category 1 follow the same rule: a scientist in an environment referring directly to his/her work: a laboratory, a hospital, a computer centre, deep under the sea (sea archaeology). The photographs do not offer any special effects; they are severe, almost sterile and there is hardly any action (except in the diving photograph). The scientists are more concentrated on their work than smiling at the camera. They are doing serious work and it seems to me that the general message of the photographs is that the scientists possess some knowledge which is hidden from ordinary people. The viewer's attention is focused on scientists instead of science. The scientists wear white coats which make them look like 'the guardians of knowledge' and at the same time make the images a bit old fashioned. If there is any statement in these photographs, it might be the advice to trust in scientists who are working for the benefit of all of us. These photographs do not show a lot; instead, they hide a lot, since 'the knowledge' is not meant to be seen (HS 8.1.2008, 29.1.2008, 25.3.2008, 15.5.2008, 1.7.2008, 7.10.2008, 30.12.2008). Compared to Aamulehti, the headlines in the articles do not convey any humour at all. They are very ordinary newspaper headlines with an active verb: 'Genetics attack the national diseases' (30.12.2008).

The photographs in the second category, representing nature, are equally clinical, not looking for any artistic or aesthetic values. The article about birds in the city (6.5.2008) has seven small scale photographs of different birds, as is found in many contemporary high school biology books. The

photographs have white narrow frames around them which emphasize the post-card look. The article about corals has one big close-up image of south sea coral, filling the whole corner of the page. This image is rich in detail but clear enough and offers the viewer his/her own space to look at the photograph without any index finger pointing at the facts that need to be learnt (26.2.2008). This photograph is a Corbis image. Also, two other nature photographs come from international stock: one photograph about oil plants (29.7.2008) and another about a young native boy sitting on a sledge with reindeers, with an oil tower in the background (15.1.2008). Neither of these two pictures gives any further information nor challenges the viewer who has read the headline. If the headline is not interesting enough, the images in question do not try to capture any more attention. There is no statement, and hardly any action. Even though the subtext talks about watering the oil plants, it looks like the bowl is leaking by itself. The use of stock photographs in these cases is clearly justified since the resources to enable a photographer to go abroad are very limited. The one and only photograph in category 3 (a scientific tool) is the massive particle accelerator photographed from high up (9.9.2008). This is a Cern photograph and the point is to show the giant size of the accelerator. The man in a hard hat standing in the centre of the photograph is there to give the machine some scale. This is an effective and legitimate scientific photograph – with a single layer of meaning, to show the latest location of a huge scientific experiment. Since all of the photographs on the HS science page more or less repeat the same story, one can ask whether the use of severe, clinical photographs on the HS science pages is a conscious choice in order to present a harsh, clinical image of science as a human activity, due to a lack of knowledge of the power of images or a result of hazardous choice? The number of similarities in the photographs leads the viewer to interpret the images inside within a consistent frame: science is severe and clinical work and the results are not meant to be seen.

In both newspapers, the most common way to use images on the science page is to add graphics to them. There were 31 of these cases compared to the 24 cases of photographs only. In six of them, there was just graphics, with no photographs at all. When graphics was added to the photographs, they were often used so much that the photographic scene was lost beneath them. Either a photograph was just offering a background for graphics or there were 5-8 stamp-size photographs in one area with explanatory graphics. These small scale photographs are used to show details, the ideal types of animals, cars or plants. The object in the picture is given a name or a long subtext. The

reason for that is clear: without an explanatory text, it would be difficult to sketch out the content of the image(s). The quality of the newspaper print is not good enough for such small scale photographs and details (HS 15.4.2008). In HS, white explanatory text areas are sometimes placed right in the middle of a tiny photograph, so it becomes almost physically impossible to see the whole image (HS 2.12.2008). Aamulehti uses text with photographs more carefully. Photographs are respected more and they are never covered by statistics or text. The additional written information is placed at the side or on the edge of the image. Collages with statistics, maps or curves in Aamulehti look more harmonious than in HS. Almost all collages in HS – photographs with graphics, text, statistics and so on – include too much information. They look packed and confusing so there is finally no place to look. When I tried to look at them, my glance wandered from one point to another. Finally, I tried to avoid looking at them at all.

A newspaper is not an educational tool; it is not a schoolbook. I do not like to be educated by a newspaper; I want journalists to tell me what is going on in the world and in society. What I want from science page articles is to offer me explanations and possible applications to scientific research or the latest science news. As an adult media consumer, I do not want to be treated like a schoolgirl reading newspaper with a magnifying glass and a pen, making notes to be remembered later. This is how I feel when reading these heavily packed collages with lots of maps and statistics. I do not believe that a good science article necessarily needs any statistics. A good storyteller – who can also be a good science journalist – is supposed to write an article without the assistance of statistics. Several statistics and curves make the article look like more professional but I really do not care much about any additional and disconnected statistical facts. Instead of statistics, the use of innovative and manipulated images or witty collages can raise the article to a new, unforeseen level, like the article about the future of Finland in Aamulehti (2.1.2008).

Some pure graphics unfortunately look like children's drawing books (HS 18.11.2008) or instructions for a new tool, with several arrows showing directions for the user to push or pull (HS 22.4.2008). In both newspapers, there are articles in which the text is reduced and space is given to a huge, complex field of graphics. Possibly accidentally, in HS, 3 out of 4 pure graphics show human brains (12.2.2008, 26.8.2008, 23.9.2008). The article entitled: 'A journey in a taxi driver's brain' (23.9.2008) is a good example of where the graphic designer has created a multilayered picture.

There is a drawing of brains, on a map of London. The brains are portrayed as a children's game where you have to get a tiny ball to move inside a labyrinth, but instead of a ball there are several taxi cabs. This is a fascinating image which raises several thoughts in the viewer's mind. Even though the other two graphics about human brains were created by the same graphic designer, the idea is missing and they end up looking like health instructions that you get from a GP.

Unsuccessful examples of confusing images could possibly be avoided if science journalists would dare to popularize their articles far enough. If they told their story coherently, there would be no need to disturb the reader's experience with explanatory supplements. Instead, the image/photograph could be used to capture the reader's interest, as they can so easily do. The popularizing of science is a concept which has not been properly elaborated in journalism. Therefore, the term causes fear and uncertainty among both scientists and journalists. The most common accusation of a science journalist is that he/she does not understand what he/she has been reporting and therefore has straightened the curves and lost the basic message or even given a false statement. This is a common weapon used against science journalist, often used by scientists who do not have any idea about the laws generating journalism. There is of course no general rule about what the optimum level of popularization is. Every journalist is responsible for it him/herself. Neither am I trying to define the concept, but I prefer science journalism which is at the same time narrative, telling a story about science. In the daily newspapers, the science page can be a part of the general journalism, without any special rules or treatment. The need for popularization and narration is naturally lower in more special publications. For a science journalist of a daily newspaper, it is of course a professional challenge to keep one's knowledge of science updated and to be a good storyteller at the same time. My rough estimation is – based on the science pages used for this paper – that the more the journalist is able to popularize difficult scientific topics, the clearer the image. It seems that the more the article is filled with details and special terms, the more the graphic designer is trying to follow the journalist's detailed style. Finally, I would dare to claim that the packed use of graphics, statistics, diagrams and several small images with explanations is seldom successful in capturing attention, but it does work to put off a newspaper reader like me.

There is still one special question which has arisen from the material: can a science photograph be funny? The answer is yes, and very often a successful image does contain a hint of humour, but

when the title is funny and the picture goes the same way (as often in Aamulehti), the limits of being funny come also closer. So far, the limits have been respected and the jokes have been so smart that the reader does not feel embarrassed.

Is it possible to create a kind of social image of science based on the photographs used? I believe that it is, even though it might not be conscious or discussed in a meeting. The following graphic attempts to summarize the results of my study. The reader has to bear in mind that the collected material covers articles from one year, and the science pages are published only every other week. Therefore, the number of samples in the different categories is not very high. As an average reader of the daily newspapers in question, after experiencing the material month after month, the journalistic idea of these science pages started to take shape, and finally it was quite easy to see the differences between the images of science in Aamulehti and in HS.

	Aamulehti	HS
Photographs	<ul style="list-style-type: none"> <li>• Wide range of images: from popular culture to science lab photographs.</li> <li>• Light atmosphere</li> <li>• Feature-like picturing. Open relation to time and space.</li> <li>• Taken by freelance journalist / use of stock photographs.</li> <li>• The use of photographs is not the main visual medium.</li> </ul>	<ul style="list-style-type: none"> <li>• Traditional press photographs: scientists in their work.</li> <li>• Clinical, serious atmosphere.</li> <li>• News-like effect. Attention paid to time and space.</li> <li>• Taken by the newspaper's own professional press photographers, if possible.</li> <li>• Photographs are the main visual media.</li> </ul>
Collages	<ul style="list-style-type: none"> <li>• Aesthetic values included</li> <li>• Less educative.</li> <li>• Result of strong manipulation.</li> <li>• Inventive, surprising, funny.</li> </ul>	<ul style="list-style-type: none"> <li>• Aesthetics does not have a priority value.</li> <li>• Educative</li> <li>• A lot of information.</li> <li>• Complicated structure.</li> </ul>



	<ul style="list-style-type: none"> <li>• Less information, in most cases, rather than a simple outlook.</li> <li>• Images speak for themselves, less added subtext.</li> <li>• Main visual media.</li> </ul>	<ul style="list-style-type: none"> <li>• A lot of statistics.</li> <li>• A lot of subtext.</li> </ul>
Graphics	<ul style="list-style-type: none"> <li>• Clear, but a demand for special knowledge in order to understand the information.</li> <li>• Schoolbook effect.</li> </ul>	<ul style="list-style-type: none"> <li>• Demanding topics are clarified but the results are confusing.</li> <li>• Big variations in quality (aesthetics/clarity).</li> <li>• Colouring book effect.</li> </ul>
image of science	<ul style="list-style-type: none"> <li>• An effort to bring science close to everyday life.</li> <li>• Scientific knowledge can be shown.</li> <li>• A striving for a large readership, not only for those interested in science.</li> <li>• Science is funny.</li> <li>• Images are clearly used to attract attention.</li> <li>• Extensive popularization of topics.</li> </ul>	<ul style="list-style-type: none"> <li>• Science and research are special work made in special places by special men/women.</li> <li>• Scientific knowledge cannot be shown.</li> <li>• Less effort devoted to popularizing science.</li> <li>• Images are used to illustrate the article.</li> <li>• Conscious of a more professional readership.</li> </ul>



## **8. Future visions and conclusion.**

A newspaper is a visual medium and images are used more and more in newspapers. The increase in the use of images is sometimes seen as a result of the increased tabloidization of the media, without any proper basis for the argument other than the fact that the amount of text has decreased the cost of the images. One symptom of tabloidization is seen as less text and more images. Why is an image a sign of tabloidization? Because the image is constantly seen as inferior to text. Pictures are also read as text: superficially, what is seen in black on white. In HS, this habit of reading images was also the rule for using images, whereas it seemed to me that, in Aamulehti, the idea of several layers of the interpretation of images, creating new meanings, was consciously used.

Before getting to know my material, I knew that photographs were used largely in science pages but what was surprising was the variety of different types of image. My preconception was to look mainly at photographs but I had to alternate my view since the habit of manipulation of images is so strong that one can no longer speak about single photographs but more or less about collages. The fear of manipulation seems to be overrated. On the contrary, manipulation – adding, cutting and creating new images digitally – can bring new metaphorical layers to a picture, but, in many cases, it can also result in a confusing mass of information. It is not easy to create a picture narrative; it is a result of professional visual skills. The latest model of digital camera does not make anybody an excellent photographer. I believe, however, that, in the future, every quality newspaper has to pay more attention to images, since the digital revolution has made the average photographer also an average PhotoShopper. It might also be possible that, since the digital correction (when is the digital correcting of a photograph gliding into manipulation?) of photographs has become the norm, the truth as an attribute of a photographic image gradually gives way to different kinds of attribute. This could give birth to the new idea of a press photograph, going towards digital narrative. Truth likeness could be just one criterion for an image in a newspaper side by side with other criteria, like making a statement, questioning, challenging, creating metaphors or seeking aesthetic elements on occasions when aesthetics is least expected. I am avoiding using the term ‘postmodern’ since it carries so many side meanings, but that could represent what I mean by other criteria than truth-likeness in the alternative use of

press photographs. Artists have known for decades how to use picture narrative and so do photographers. However, the use of images in the print media often sticks to old fashioned standards, like illustrating articles in a cake-on-a-cake style. The quality newspapers' fear of the elements of entertainment can effectively prevent them from using creative design in image production.

The educative element that was lurking behind so many of the graphics and collages I found among my material is something to be avoided in daily newspapers. A contemporary reader does not want to be educated by a journalist who is actually the second-hand keeper of the scientific knowledge he is delivering in his/her article. The concept of science in a country with a strong educational ethos seems to carry with itself a by-effect of enlightening the readers. Journalists act as teachers, trying to create handouts for their students, forgetting what their original mission as a journalist is. Critical science reporting is mostly neglected, since science is regarded as having a key importance to the success of the nation also in high level political speeches. The strong demand of objectivity as a criterion for scientific research somehow stamps also the whole notion of science journalism. Some seem to believe that science is produced in an idealistic community, outside the infallible human society, in a vacuum that does not have any ideological, political, economical or personal ties. It should be clear to everybody that science as an institution should not be outside critical reporting, and what is interesting also is that science photographs are a part of science reporting. Here, I would like to mention an important quotation from Marita Sturken and Lisa Cartwright: "Scientific images have cultural meanings that govern not only how they are produced and for what purpose but also how they are interpreted and gain cultural value" (Sturken & Cartwright, p.384, OUP 2009). Images on the science pages are not harmless illustrations but they direct general attitudes. For example, photographs of unborn foetuses can be used in anti-abortion campaigns to make a foetus look like a living child. Eugenics is another example in which illustrations and photographs are largely used as 'evidence' of different human races. In our own time, science, in the form of the business of medicine and the use of modern genetics as an explanation of human behaviour, is all loaded with ideological, political and economical consequences. Another quotation that is extremely important from this point of view speaks about the narrative system of photographs and how it should be enlarged: "A radial system has to be constructed around the photograph so that it may be seen in terms which are

simultaneously personal, political, economical, dramatic, everyday and historic” (Berger, *About Looking*, p.67, Bloomsbury 2009, UK).

The question that arose during the research is also linked to education: Is the meaning of journalism to produce contents to be remembered? The contemporary flow of information is so huge that I cannot avoid asking about the relevance of getting so much pulverised information all the time. We are surrounded and fed by a huge flow of information, day after day, instead of selecting for ourselves what we want to know. News 24/7 is overloading our everyday lives with topics from all over the world that we are supposed to regard as important. The idea is however to fill the broadcasting time in a given format instead of offering crucial information for people’s use. I wonder if any news editor has ever asked him/herself how much of yesterday’s news is remembered after a day, a week or a month. According to their definition, news does not look back; it has only one direction, which is towards on-line reality. An academic dissertation by Anja Hatva, the University of Tampere, 2009, (“Merkityksen välittäminen kuvan avulla”, “The transmission of meaning by images”, own translation) deals with the question of remembering written information. Hatva writes that the human capacity to recognise and remember the information provided in images is far better than our capacity to remember written material (Hatva, p.12, Tampere 2009). This could be one explanation why images have been used more and more in newspapers and a reason for removing the label of tabloidization from the increased use of photographs in daily newspapers. The simple fact is that an image helps us to remember information. The targeted use of images in a newspaper can shape the floating news sphere and offer hooks to the audience in order to attract their attention.

Although we like to say that a photograph speaks, especially a press photograph, it does not. A photograph is a missing voice (Sontag, *On Photography*, p.108, Penguin Books 1979). A photograph shows its object on a flat screen or a piece of paper, cut out of reality, transferred to a place where to which it did not originally belong. Therefore, what is seen in a photograph needs to be interpreted in order to receive a meaning. Another thing is that, when one wants to evaluate a photograph, one cannot employ the same criteria as when evaluating a text. An image uses a different logic than spoken or written language – or valid argumentation. What is needed for the support of a valid interpretation is also a sensibility to recognize visual nuances. In an image, the

message is often in the minor details instead of the evident major layout. In his book, Scott Downman gives some basic advice about what to avoid showing in a press photograph: the grip and grim, the turning of the first sod, a staged press conference, a firing squad group shot and a social shot, people with cheesy grins, holding glasses of plonk (Downman, *A Guide to layout and publication*. p. 93, OUP 2009). These kinds of occasions are often valuable moments for news reporting, but photographers are advised to avoid presenting rough reality, since it is often boring to view. A photographer in his personal choice is free from repeating the logic of the order of importance. A photographer can stress a funny detail, and exaggerate or laugh at serious human efforts. It is not that science is either a funny or a serious business. It is both at the same time.

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